

Responses to Comments from EPA, ATSDR, NYSDOH, and the City of New York on the Draft Remedial Investigation (RI) Report

United States (U.S.) Environmental Protection Agency (EPA) - Joel Singerman

1. Pages ES-1 and 1-2: The text states that 1133-1139 Irving Avenue was formerly owned by Arctic Glacier Losquardo, Inc. If Arctic Glacier no longer owns the property, then the current owner should be identified.

Response: This information will be included in the Final RI Report. The property was recently transferred to a new owner. EPA has provided the new owner's name. CDM Federal Programs Corporation (CDM Smith) will follow up to verify ownership.

2. Pages ES-3 and 1-4: An attribution for the statement by the U.S. Department of Energy (DOE) should be included.

Response: The text will be revised to include a reference to the Radiological Scoping Survey for Former Wolff-Alport Chemical Corporation Site completed by Louis Berger & Associates (LBA, 2010), from which the statement made by the DOE was taken.

3. Page ES-3: The initial scoping-level radiological surveys performed by the New York State Department of Environmental Conservation (NYSDEC), New York City Department of Mental Health and Hygiene (NYSDMHH), and EPA in 2007, and the investigations performed by EPA in 2012 and 2013 are not included in the bullets

Response: The list on this page and on Page 1-6 will be revised to include these investigations. A brief summary of each of these investigations will be included in Section 1.2.3 Previous Investigations and Results.

4. Pages ES-3 and 1-5, fourth bullet: A hyphen is missing between "Wolff" and "Alport."

Response: The bullet will be revised to include the hyphen between Wolff and Alport.

5. Page ES- 5, fifth bullet: Agency for Toxic Substances and Disease Registry's (ATSDR's) 2012 Health Consultation should be included in an earlier bullet and this first reference to "ATSDR" should be spelled out with the acronym identified.

Response: ATSDR's initial 2012 Health Consultation will be included in an earlier bullet in this section and on Page 1-6. A brief summary of the initial health consultation will be included in Section 1.2.3 Previous Investigations and Results.

6. Page ES- 5, fifth bullet: Add a space between "the" and "2012."

Response: This bullet will be revised to include the space.

7. Page ES-5: Following the bullets, a section should be added that describes the removal actions performed by EPA and should note the listing of the site on the National Priorities List (NPL).

Response: The following paragraph will be added to the executive summary following the bulleted listed.

“In April 2013, EPA installed fencing at the site and shielded portions of the radioactive soil with rock and clean fill to reduce accessibility to the waste material. Additional shielding consisting of lead, steel, and concrete was installed within several structures at the WACC property and along a portion of the Irving Avenue sidewalk. These activities were completed in December 2013. Following completion of these initial investigation and mitigation activities, the site was listed on the NPL on May 12, 2014.”

8. Pages 1-4 – 1-6: It is suggested that the text in the “Investigation/Regulatory History” section be relocated in its entirety to the appropriate chronological location in Section 1.2.3, Previous Investigations and Results. Further, the bullets on p. 1-5 should include the initial scoping-level radiological surveys performed by the New York State Department of Environmental Conservation, New York City Department of Mental Health and Hygiene, and EPA in 2007, and the investigations performed by EPA in 2012 and 2013.

Response: The text in the Investigation/Regulatory History will be relocated to its associated text in Section 1.2.3. References to the various initial scoping level investigations will be included, as noted in the response to Comment 3.

9. Page 1-14: Section 1.3, Report Organization, should be relocated to the beginning of the document.

Response: Section 1.3., Report Organization, will be relocated to follow Section 1.1, Purpose of the Report.

10. Page 4-20, first bullet: Because the polychlorinated biphenyl (PCB) acronym has already been defined, “polychlorinated biphenyls” should be eliminated and only the acronym provided.

Response: The revision will be made to the text.

EPA - Lora Smith

General Comments:

11. I concur with the EPA hydrogeologist’s comment that it would be beneficial to better refine our understanding of the chlorinated volatile organic compounds (CVOs) and underground storage tanks (USTs) in the northern, upgradient portion of the site. Both tetrachloroethene (PCE) and trichloroethene (TCE) resulted in unacceptable noncancer hazards to those receptors consuming groundwater as drinking water in the future. Groundwater flow direction has changed in the vicinity of the site historically and as a

result, the lines of evidence provided are not strong enough to discount the site as the source of these contaminants.

Response: To clarify, there are two areas with former suspected USTs.

- Lot 48 USTs - Based on a review of Sanborn maps and descriptions of the historic site use in the Phase I report (LBA 2010), it is our understanding that the USTs in the northern, upgradient portion of the site were associated with a gasoline filling station that was located on Lot 48, and were unlikely to contain CVOCs. Geophysical studies found only what appears to be piping left behind in the area.
- Southeast of Cabinet Maker Building - A potential location of a historical UST was identified in the area southeast of the cabinet maker building based on suspected remnant piping detected during the RI field activities. This is likely the remains of the UST EPA has identified as having been removed in this area. The contents of this UST were unknown, but the location is on the downgradient side of the site.

Since a likely source of the CVOCs in groundwater could not be identified onsite, EPA has directed CDM Smith to install an upgradient well to better characterize the CVOC groundwater contamination. The monitoring well will be installed and sampled in March/April 2017, and the results of this sampling will be included in the Final RI.

12. EPA (ARD/OSRTI) has recently (12/21/16) issued a new risk assessment document regarding a noncancer oral RfD for uranium which should be incorporated into the risk assessment and may impact cleanup goals for Wolff-Alport:
<https://semspub.epa.gov/work/HQ/196808.pdf>.

Response: The document referenced recommends the use of the ATSDR minimal risk level (MRL) for soluble uranium instead of the reference dose(RfD) currently provided on the Integrated Risk Information System (IRIS). However, it must be noted that the samples collected during the RI were analyzed for uranium isotopes not total uranium. Uranium isotopes are evaluated in the Human Health Risk Assessment (HHRA) using isotope specific cancer slope factors; non-cancer effects are not assessed. This issue will be discussed in the HHRA uncertainties. An estimate of uranium mass from isotopes can be estimated and screening level non-cancer hazard calculations performed.

This comment and other comments discussed herein reference changes to the Summary of the Risk Assessment included in Section 6 of this RI Report. Although this comment was not made on the Draft Human Health Risk Assessment (HHRA), this comment and others pertaining to the HHRA were generally or specifically addressed in the Draft HHRA Response to Comments that was provided to USEPA on February 20, 2017. Section 6 (Risk Assessment Summary) of the Final RI Report, which is a limited summary of the HHRA, will be revised after EPA approval of the Final HHRA.

Specific Comments:

13. Page ES-3, Previous Investigations: Please confirm that data from the various previous investigations meets the data quality objectives set for this site in the Quality Assurance Project Plan.

Response: The data from previous investigations was used along with the new investigation data to define the nature and extent of contamination. It was not used in the Risk Assessments to calculate risk. The previous data used in the RI included gamma scan and gamma exposure data collected by EPA and NYCDOH and soil and sewer sediment sampling data collected by New York City Department of Environmental Protection's (NYCDEP's) subcontractor, New York City Department of Design and Construction's (NYCDDC's) subcontractor as well as EPA Emergency Response Team (ERT). The historical data was not formally assessed as part of the data usability; however, for the purpose the data was used in the RI (to supplement and confirm new data collected) the previous data generally met the data quality objectives set forth in the Quality Assurance Project Plan (QAPP).

14. Page ES-4, last bullet: Typo – Please amend to “school and day(care) radon evaluations.”

Response: The text will be revised to correct this typo.

15. Page 1-13, Gamma Radiation Assessment, 3rd bullet: Values for contact and waist level appear to be switched.

Response: This data was collected as part of the 2014 Weston investigation. Upon review of the text, data tables, and survey figures in the Radiation Assessment and Response Action Report (Weston 2014), these values are correct for contact and waist level. Please note that post shielding waist level readings are higher than the contact level because of shine from building material.

16. Page 2-1, Radiological Building Materials Survey, Floors: Why weren't gamma readings taken on contact and at waist level as they were elsewhere at the site? It states that floor areas in portions of lots 42 and 44 were not measured for gamma due to the placement of shielding. Were areas along the edges of the shielding measured to estimate exposure to radiological shine?

Response: Gamma scans were performed within the buildings and throughout the site for the purpose of determining soil boring locations. Gamma reading from shielding areas and along the edges are present in the Radiation Assessment and Response Action Report, prepared by Weston Solutions, Inc, dated April 2014.

17. Page 3-3, Regional Groundwater Flow: Groundwater in the region sounds fairly complicated with a divide and heavy urbanization affecting the flow. The most recent United States Geological Survey (USGS) flow map (2010) shows groundwater at the site to the southeast. This is now 6-7 years old. Does our current well network for the site satisfactorily capture groundwater flow at the site? Does it mirror the regional flow as established by USGS in 2010?

Response: As stated in the comment, regional groundwater maps show groundwater flow generally to the south-southeast. The USGS maps are based on data collected from a monitoring well network that is very widely spaced. Our current well network suggests that localized groundwater flows more southerly. It appears that the differences are related more to the spacing of the data rather than conflicting data. We are installing an additional upgradient well that should help verify flow direction. See response to Comment 11 for more detail.

18. Page 4-4, Background Soil Sampling: Radiological screening levels are based on the background dataset. Please provide a more thorough discussion on how background locations were selected and what statistics were run to determine that the locations are appropriate to use as background. This should include any potential sources of radiological contamination such as fill material. EPA prefers that site-specific screening levels be selected using the online radiological preliminary remediation goals (PRG) calculator: https://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search.

Response: CDM Smith will modify the RI text for this section to include the rationale for background location selection and the data analysis to determine if the selected areas truly represented background for the Queens/Brooklyn area. The background sites were selected based on distance from the site and composition of the background area (physical setting, likelihood of fill, ground cover, etc.). The intent was to establish soil background concentrations from areas with the least likelihood of impact from site activities and disposal operations. By using soil as the background metric, any contribution from construction-related materials during site sampling would bias the identification of a potentially impacted area in a positive direction.

The results were analyzed using ProUCL and the Shapiro-Wilks goodness of fit for Normality applied to the data set. Use of the "Normality" test is a standard practice to determine if a data set is consistent with a typical background distribution. In addition, the mean and range were reviewed against typical non-impacted site Th-232 and Ra-226 concentrations to ensure consistency with those values. Finally, a 2"x2" NaI detector survey was performed of the selected background site, prior to sampling, to identify any anomalous high activity areas that may skew the calculated 95% Upper Tolerance Limit (UTL); no anomalous count rate areas were detected.

The screening criteria for the remedial investigation were established through several conference calls with EPA and are summarized in the screening criteria technical memorandum and the meetings minutes that have been provided to EPA. It was decided that the screening criteria for determining nature and extent of contamination in the RI would be based on a 95% UTL for background. CDM Smith will utilize the PRG calculator to aid in developing PRGs for the feasibility study.

19. Table 2-2: Please indicate dates of use for each of the instruments.

Response: Dates for use of each instrument will be included in the table.

20. Table 4-5: Please provide a note that a blue highlighted cell indicates an exceedance of RI screening criteria. Also, please bold detections for ease of review. This applies to all analytical data tables.

Response: The formatting changes will be made to the data tables.

21. Tables 4-24 and 4-25: Where were these radon/thoron samples collected (which building(s))?

Response: These samples were collected from within the school buildings. Clarifying text will be added to the tables to provide a more detailed description of sample location within the school. Air sample locations and data will also be presented on a figure.

22. Figures 4-3d and 4-3e show radiological contamination on the ceiling/roof of Primo Auto Body along Irving Ave at 5-10x background. Since shielding was installed below this and Terra Nova and no gamma readings were taken on contact/waist level, can we be certain that the shielding is sufficient? What else could be the cause of this contamination? EPA suggests confirmatory gamma measurements from contact/waist level within these businesses.

Response: Elevated gamma scans from the roof were in the same area as elevated gamma scans of the walls below that are associated with former production areas. The contamination in the walls was confirmed by laboratory analysis of the brick/concrete. Gamma exposure rates from within the building suggest that contamination on the roof is more likely due to contaminated building materials. See response to Comment 16 for more detail regarding gamma measurements that were performed within the building referenced in this comment.

23. Figure 4-4: Please indicate units for non-radiological contaminants. Polycyclic aromatic hydrocarbon (PAH) concentrations appear to be high (units unknown) in the southeastern portion of the site and are likely site-related.

Response: Units for the data on Figure 4-4 are presented in the notes. The figure will be revised to make this more evident. The high PAH concentrations in the southeastern portion of the site are likely associated with the removal of underground storage tanks and stockpiling of the excavated soil in this area.

24. Figure 4-5a, Combined Th-232/Ra-226 Concentrations in Soil: Contamination below Primo Auto Body could go deeper than 30 feet and will need to be delineated either for the RI or during remedy design.

Response: There is the possibility that contamination has migrated deeper in this area, but our current sampling suggests that is not the case. Borings completed as part of this RI (SB-07 and SB-08) and previous borings through the floor of the building found contamination from the ground surface down to about 25-28 feet below ground surface (bgs). Both RI borings had additional samples below these depths down to 30 feet bgs that were below background concentrations (the screening criteria). Gamma scanning of boreholes to

approximately 20 feet bgs during previous investigations also supported this conclusion. Due to drill rig access limitations, the ability to collect deeper soil samples from below the auto shop is limited while the building is standing and in use. The possibility of additional contamination would be assessed during the Pre-Design Investigation for the Remedial Design.

25. Figure 4-7, Sewer results: Please identify locations with compromised structural integrity for future sampling efforts. Along Irving Ave., it isn't clear which direction the sewer flows (assumed to the NW). Please make sure directionality arrows are visible amongst data points.

Response: The figure will be revised to present the areas of compromised structural integrity in the sewer line. The directionality arrows will be emphasized.

26. Figure 4-10a: Keep color coding consistent amongst figures. Previous figures used green to indicate <background and blue for <2x background.

Response: Figures 4-10a through 4-10c will be revised to be consistent with color coding in other figures. Green will be used to indicate concentrations < 12 microRoentgen per hour ($\mu\text{R/hr}$) (background). Blue will be used to indicate concentrations 12-24 $\mu\text{R/hr}$ (<2x background). Yellow will be used to indicate concentrations 24-60 $\mu\text{R/hr}$ (2-5x background). Orange will be used to indicate concentrations >60 $\mu\text{R/hr}$ (>5x background).

EPA - Kate Mishkin

27. Data collected at Wolff-Alport do not appear to be submitted in the Region 2 Electronic Data Deliverable (EDD) required format. A site database is mentioned on page 4-7, but there is no discussion about data submission to EPA nor is it currently in our EQuIS database. Please submit the data accordingly.

Response: A comprehensive EDD of all sampling performed by CDM Smith will be submitted with the Final RI following the performance of recently approved additional investigations.

28. In previous discussions with CDM, the inclusion of data collected from a nearby USGS well pair (Q3649.1, Q3587.1) was discussed; however, this information is not included in the report. Water levels have been measured over 150 times and data show fluctuations of 4-6 ft since the mid-1990s. The water quality has also been sampled and those results are publicly available. While these wells are sidegradient of the site, these data would help to inform overall groundwater directions, variations in gradient, and groundwater quality in the vicinity of the site (e.g. to perhaps better understand the source of background concentrations). Please amend the report to include this information, perhaps in an appendix. The data source has been provided previously, but could be supplied again if necessary.

Response: CDM Smith reviewed the location of and data from the USGS well pair. They are several thousand feet cross-gradient to the east/ north east of the site. Samples from the

wells did not contain chlorinated volatiles and the groundwater elevation data from these wells and other wells collected in 2010 by USGS are presented in the regional groundwater flow figure in the RI (Figure 3-4). A review of the other wells in the area did find a few other USGS wells further north of the site, but none that are clearly upgradient of the site. CDM Smith summarized historical groundwater flow in Section 3.3.1, and included a review of the historical flow in the area that was prepared as part of the NYCDDC Phase II Report in Appendix A.

As discussed in the response to Comment 11, an additional well will be installed and sampled upgradient of the site in March/April 2017. Data from this newly installed well and nearby USGS wells in the area will be discussed in the Final RI.

29. Overall, the description of groundwater screening efforts in previous investigations and those associated with the RI is not clear. The work plan describes how proposed monitoring wells are co-located with deep soil borings and that groundwater screening samples would be collected from these deep soil borings, but that is not discussed here. On page 4-12 it discusses the NYCDDC Phase II Investigation and that groundwater screening samples were analyzed, but this is misleading since groundwater was not actually encountered during this investigation (which is noted elsewhere in the report). Additionally, in section 4.6.2 Perched Groundwater Sampling at 335 Moffat Street, it mentions that one groundwater sample was collected from a perched groundwater zone, but the context of this perched zone and sampling location is not discussed in the document. Please clarify these points.

Response: Groundwater screening was not included in the Final Workplan or QAPP for the RI. The value of screening data for radiological contaminants is extremely limited as samples cannot be expedited and a turbid screening sample is not representative of groundwater quality. Since the general groundwater flow direction was known, and since groundwater was deep and not easily sampled it was determined that five wells would be installed to provide reasonable assessment of the groundwater conditions at the site.

The reference to NYCDDC Phase II groundwater screening is incorrect and will be removed. Those investigations did not extend deep enough to encounter groundwater as is described in Section 1 of the RI report.

Additional context will be added to the report regarding groundwater sampling of a perched groundwater encountered below the former ice production building at 335 Moffat Street. Perched water is not unexpected in this area as large amounts of water would have been used in the ice production process. Borings completed adjacent to this area on Moffat Street during the RI did not encounter any perched water.

30. The work plan discussed how the locations of permanent monitoring wells would be selected based on the completion of the initial soil boring program. Though Figure 2-3/Table 2-4 show which monitoring wells were co-located with soil borings, the details of this effort are not discussed sufficiently in the RI. Please amend to discuss the rationale of the final monitoring well locations.

Response: The locations of the monitoring wells were selected based on a review of the previous data collected at the site and based on regional groundwater flow in the vicinity of

the site. Monitoring well locations were selected to characterize groundwater quality at the site to include an upgradient and downgradient well in relation to the radiological contamination source. Section 2 of the RI will be amended to include a discussion of the rationale.

31. Perhaps the report can provide clarification with respect to CVOCs and the USTs in the northern portion of the site. The report concludes that since CVOCs were not detected in soil samples and the Phase I report did not indicate the use of materials currently or in the past that would be associated with CVOCs that they are not site related. However, the two caveats to this are that CVOCs are less likely to sorb to the sandy silts/gravels soils that are found at the Site and that the contents of the USTs are not fully understood with exception to the potential link to PCB and PAH presence (3 listed as unknown). Since the USTs are in the northern portion of the site and this is also the upgradient side of the site where we are finding the maximum CVOC concentrations, perhaps some additional clarification or detailed uncertainty would be beneficial to include. Finding the concentrations of CVOCs detected in side-gradient USGS wells would help to clarify this.

Response: See response to Comments 11 and 28.

Specific Comments:

32. Page 3-4, Section 3.3.3 Site Hydrogeology – The groundwater level measurements collected on Dec 8, 2015 are described in this section. Since synoptic water level measurements were also collected in April 2016, please describe any changes in water levels, gradient direction and horizontal gradient if there is any variation between synoptic events.

Response: Section 3.3.3 will be expanded to include a discussion of all synoptic water level measurement events. A figure will be created for the last round of water level monitoring data collected to be completed in March 2017.

EPA - Oleg Povetko and Larainne Koehler

33. Page ES-2 Para 1 Sentence 1. Suggest including “school, day care center...” to the list.

Response: The sentence will be revised to state: “The neighborhoods surrounding the WACC property contain light industry, commercial businesses, residences, a school, and a daycare”.

34. Page ES-3, Previous Investigations. Suggest adding bullets describing following studies:
“- EPA results (EPA/RIAB, 2013a, 2013b, 2015)
- Weston results (Weston, 2012). “

Response: The list on ES-3 and on Page 1-6 will be revised to include these four investigations. A brief summary of each of these investigations will be included in Section 1.2.3 Previous Investigations and Results.

35. Page ES-4 Bullet 3 Suggest revising sentence as follows. “School and daycare investigations including soil sampling at the school, school and daycare gamma exposure rate surveys, school radon/thoron and daycare center radon evaluations.”

Response: The sentence will be revised as noted in the comment.

36. Page ES-5 Air. Suggest revising paragraph as follows. “Previous investigations found concentrations of radon and thoron above the screening criteria in indoor and outdoor air at the WACC property. Air sampling conducted prior to radiation mitigation activities in 2012 and 2013 found the highest levels of air contamination at Lots 31, 42, 44 and 46 where the majority of the WACC processing activities took place (Lois Berger, 2010; Weston, 2012; EPA/RIAB, 2013a,b, 2015). The highest concentration of thoron in air was detected on Lot 31 Following Lot 42 radiation mitigation activities the radon levels dropped inside building occupied by Terra Nova company to below screening criteria.”

Response: The paragraph will be revised as stated in the comment.

37. Page E-6 Last Para Last Sentence. Suggest clarifying whether readings were taken on sidewalk or roadway of Irving Avenue.

Response: The sentence will be revised to clarify that readings at those two locations were collected on the roadway of Irving Avenue, one near the curb and the other in the middle of the street.

38. Page ES-7 First Para Last Sentence. Suggest revising sentence as follows. “These investigations showing data slightly above RI screening criteria but the amount of data is not sufficient to conclude that contamination is due to the WACC processes.”

Response: Additional investigations activities are being performed. The text will be revised appropriately based on the results of the additional investigations.

39. Page ES-10 Bullet 7 First Sentence. Suggest adding “...within the CSS...” after “Gamma levels...” for clarity.

Response: The bullet will be revised to state: “Gamma levels within the CSS generally drop to four times background at the intersection of Irving Avenue and Schaeffer Street, and drop to background at the intersection of Irving Avenue and Eldert street...”

40. Page ES-11 “Data Gaps”. Suggest adding a bullet:

- Additional radon and thoron air concentration data is needed for school and daycare center basements. Also, additional soil data is needed from school and daycare basements as well as from Moffat Avenue between two buildings. The elevated thoron readings were observed in both basements facing Moffat Street (EPA, 2013B) and elevated thorium soil concentrations were recorded at SCSB-01 through SCSB-03 locations between two buildings, as reported in this Draft. Data is needed to either locate and evaluate the underground contamination or rule it out.

Response: EPA has directed CDM Smith to collect soil data from the school and daycare basements. In addition, a five-day continuous radon/thoron measurement will be performed at the daycare. The additional investigations are summarized in the Work Plan Letter Data February 7th, 2017. The Final RI Report will be revised based on the results of the additional investigation activities to be performed in March 2017.

41. Page 2-14 First Para. Suggest mentioning and considering in further sampling another UST that was originally located on Lot 31 adjacent to the southernmost wall of Lot 33 Warehouse on Lot 33. This UST was removed during EPA response action.

Response: The geophysical survey conducted in 2015 by CDM Smith detected an anomaly in this area, which appeared to be remnant piping at the location of a previous UST. Additionally, a large stockpile of contaminated dirt was found near the area. This dirt is likely associated with tank removal. CDM Smith believes there is enough data in this area to describe the extent of contamination for this RI Report and develop remedial alternatives. Additional sampling of the stockpiled soils for non-radiological contamination (for disposal purposes) can be performed as part of a pre-design investigation during the Remedial Design phase.

More detail regarding this response action is requested. Information regarding the tank size, sampling data, and removal procedures would be useful.

42. Page 4-12 Second Para. Suggest adding the sentence. "The shed does not have a concrete slab foundation underneath, is sealed except the door and has no ventilation system inside."

Response: The following sentence will be added to the paragraph: "The slab does not have a foundation, does not have a ventilation system, and is sealed except for the doorway."

43. Page 4-28 Para 4. Suggest adding after first sentence. "Anecdotal evidence exists that the previous tenant of 335 Moffat Street, Ice Glacier company, was discharging its waste water through the system of PVC pipes to the ground at Moffat Street in the vicinity of MW-05 due to lack of or poor connection to the CSS line at that location." (See Appendix 1).

Response: This information will be included in Section 3.1 Topography and Drainage and will reference an appendix of the photos that were included in EPA's comments.

44. Page 4-31 Daycare. Suggest adding the following. "Previous investigations (EPA, 2013b) reported elevated levels of thoron above screening criteria in the switch room of the Daycare Center's basement. The room had two CSS openings in it. The two-day average thoron concentration at the openings was at 2.1 picoCuries per liter (pCi/L) level, i.e. about 21 times of the site-specific background, peaking at about 34 times of the background."

Response: This text will be added to this section. The investigation will also be summarized and included in Section 1 of the report.

45. Page 5-9 Para 2 First Sentence. Suggest revising the sentence to reflect chemical processing that took place at former WACC. The IAEA most likely reference thorium tailings from

which thorium was extracted. In case of former WACC, the ores were processed to increase concentration of rare earths in the final product, not thorium while thorium was in the waste stream of the process. Therefore, most likely, WACC tailings had higher concentrations of thorium in them.

Response: The paragraph will be revised to emphasize the chemical processing that took place at WACC, which would have resulted in higher concentrations of thorium in the waste streams.

46. Page 6-4 Para 3. Suggest adding. “Installed radiation shielding reduced annual external dose to workers and public below annual regulatory public limit of 100 mrem, not necessarily below 10^{-4} lifetime risk of excess cancer. No radiation shielding was installed on Irving Avenue roadway that is frequently used by pedestrians and auto workers.”

Response: This section will be revised accordingly.

47. Page 6-5 Second Para. Suggest adding after second paragraph. “During previous investigations (Weston, 2012) 13 vents, i.e., gas exit points, of thoron were identified on Lot 31 and Irving Avenue roadway and sidewalk. The thoron concentrations ranged from 0.17 to 366 pCi/l with 10 readings above 10 pCi/l. Additional vents and multiple readings exceeding screening level for thoron concentration have been documented in previous studies (Weston, 2016). Short term 4-hour measurements taken at the vent with maximum flow after one foot of concrete shielding was installed above it, showed reduction of thoron concentration from 366 to 172 pCi/l above one foot thick concrete slab. Given drastic fluctuations in thoron flow, this reduction might be partially due to gas flow fluctuation and partially to the reduction by the concrete slab. There are clear indications of continuous gentrification of the neighborhood. Current construction of multi-unit residential building at 308 Cooper Street (Equity Environmental Engineering, 2016) that would face WACC site across Irving Avenue, is not deterred by the fact that the lot is zoned as “light industrial”. The warehouse at 338 Moffat Street was converted to residential units, that are all occupied, despite the lot’s continuous and current zoning designation as “industrial”. If, in the future, the WACC site and adjacent areas are used for residential construction without remediation of underground source of thoron, the thoron emanating from the surface may accumulate in the basements and first floors of the residential dwellings in concentrations that would cause exposure in excess of 10^{-4} lifetime risk level and/or exceeding EPA Action Level for radon in residences.”

Response: The section of the Draft RI Report (Section 6) referenced in the comment is a limited summary of the Draft HHRA. These issues will be addressed in the Final HHRA. Section 6 of the RI report will be revised based on a Final HHRA. Please see the response to Comment 12. The investigations described in this comment will be summarized in the Previous Investigations section of the RI Report (Section 1) and added to the discussion of nature and extent of contamination in Section 4. The HHRA evaluates future scenarios for onsite residents in the absence of any remediation to help determine whether remedial efforts are needed. These scenarios include radon and thoron exposure pathways.

48. Page 7-2 Bullet 6 Last Sentence. Suggest revising sentence as follows. “These investigations showing readings just slightly above RI screening criteria, but the amount of data is not sufficient to conclude that contamination is due to the WACC processes.”

Response: See response to Comment 38.

49. Page 7-3 First Para. Suggest adding bullet: “- Additional radon and thoron air concentration data is needed for school and daycare center basements. Also, additional soil data is needed from school and daycare basements as well as from Moffat Avenue between two buildings. Data is needed to either locate and evaluate the underground contamination or rule it out as insignificant.”

Response: See response to Comment 40.

50. Page ES-1 – Table. Lot 42 – 1129 Irving – There is an office in Terra Nova, which is frequently occupied, including sometimes by a child. Any description of the property must include the office. This table needs to be corrected here and elsewhere in the RI & Appendices

Response: The table on ES-1 and on page 1-2 will be revised to include the office in Terra Nova. All text throughout the RI that provides a description of the Terra Nova building will be revised to include the description of the office.

51. Page ES-2 – Paragraph 2. Adjacent property has a legal and common connotation of sharing a property line. The school and daycare are not adjacent to the WACC. Revise wording here and elsewhere in the document.

Response: The sentence will be revised to refer to “the following nearby properties” rather than “adjacent properties”. The first sentence in the second paragraph on Page 1-3 will be revised as such.

52. Page ES-3 Previous Investigations. It is not clear that all of the investigations have been included, particularly in the school and daycare.

Response: See response to Comment 3.

53. Page ES-4 Bullet 3. Revise – School and daycare investigations including soil sampling outside the school, school and daycare exposure rate surveys and school and daycare radon/thoron evaluations. As discussed we do not agree with the idea that radon should be used to cover both.

Response: See response to Comment 35. Text will be revised to separate radon and thoron.

54. Page ES-5 Air. The fact that a radon mitigation system was installed in the Terra Nova property prior to radiation shielding has not been included.

Response: The text will be revised to include this on ES-5, page 1-13 Radiation Mitigation Activities, and Page 4-11 Results of Previous Site Air Sampling.

55. Page ES-6 Groundwater. Are there any concerns that drought in 2016 impacted groundwater sampling results?

Response: The drought and other long term fluctuations in groundwater recharge would impact water levels on a regional scale; however, these fluctuations would unlikely impact the GW sampling results. CDM Smith believes that the data generated is representative of the groundwater chemistry below the Site. Additional rounds of groundwater level data to be collected in March/April 2017 will also be presented and discussed in the Final RI Report.

56. Page ES-7 – School Investigation. Not enough data has been collected to rule out contamination at the school. In addition to data above the RI screening criteria, the entry point into the school basement showing radon and thoron entry, which was subsequently closed has not been explained. The daycare center is not even discussed here, but also had some unexplained elevated levels. RIAB provided this information after the RI data meeting, but it does not appear to be included.

Response: See response to Comment 49 describing additional investigations to be performed. The new data and historical measurements collected will be utilized to revise the Final RI Report.

57. ES-8,9 HHRA. The wording discussing risks in terms of ‘annual radiation dose’ is unlikely to be clear to people who are not in the ‘nuclear physics community’. Should this be dose limit? Provide a clearer explanation or delete.

Response: See Response to Comment 12. This entire section will be replaced to reflect the Final HHRA. The use of annual radiation dose will be clarified if included in the final text.

58. Page ES-11. As discussed previously, we do not agree with the conclusion about the school and daycare. Daycare is not spelled consistently sometimes daycare – others day-care – use the terminology that the facility uses and do it consistently. There is a data gap for school and daycare – it is the project manager’s decision when that data should be obtained.

Response: The RI Report will be reviewed for consistency in using the terminology for daycare, and revised accordingly. Additional investigation activities are being performed to address the data gap in the school and daycare. See response to Comment 40. The text will be revised based on the results of the additional investigation activities.

59. Page 1-3 308 Cooper Street. This property is not zoned residential according to correspondence on current cleanup activities. It is being developed as a residential property, which indicates that any of the properties in the area should be considered as potentially residential. If the prior residential structures were in place since 1914, that would seem to indicate that age of a building is not a good indicator of the likelihood of contamination.

Response: The contamination at 308 Cooper was limited to one location outside of the footprint of the previous building structure. The former residential structures at the property were demolished and the lot has been abandoned since 2007. The residential future use scenarios are addressed in the Risk Assessment.

60. Page 1-5. There are discussions of thoron concentrations found at WACC property, but no discussion of elevated readings at school or daycare.

Response: A summary of the previous investigations performed at the school and daycare will be added to the Previous Investigations section.

61. Page 1-6 1.2.3. It would appear that not all radon/thoron assessments at the school and daycare are included in the summary or in the Appendices provided.

Response: The prior radon and thoron assessment results will be summarized and the reports that EPA recently provided will be added to Appendix A.

62. Page 1-12 – Last bullet. This paragraph is incorrect. Radon levels did not approach the applicable OSHA limits for radon unless the juvenile seen at Terra Nova is an employee. The ATSDR report does acknowledge that the radon mitigation system reduced the radon levels in Terra Nova, which is not reflected in this statement. Since the reduction of impact due to removal actions at the site is stated as the reason for the updated report, that should be the focus of this paragraph.

Response: This section of the RI was summarizing previous investigations or assessments of the site. The bullet referenced was extracted from the conclusions of the ATSDR report. However, as stated in the comment, it is not the important point of this section, and therefore will be removed in the Final RI.

63. Page 2-11. NYSDEC has expressed some concern about the use of the Staten Island Creek to establish background sediment data.

Response: Coney Island Creek was identified as the location for background sample collection during the planning phases of this project, and was approved by USEPA in the Workplan and the QAPP. The results of sampling in Coney Island Creek showed Th-232 ranged from 0.23 pCi/g to 0.645 pCi/g. When comparing these values to the background values found in soils as part of the 2015 RI, they are reasonable.

64. Page 2-13. Please correct the certification to be by the National Radon Proficiency Program, which is a division of AARST. It should be referred to as AARST-NRPP or NRPP.

Response: The statement will be revised to state: “CDM Smith Radon Specialist, certified by the New Jersey Department of Environmental Protection, completed radon measurements at both facilities in accordance with EPA’s Radon Measurement in Schools Guidance document, dated July 1993.

65. Page 4-1 Data Quality. Is there any evaluation of data quality for radon/thoron results?

Response: Radon/thoron analysis were performed by NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, and the results were valid values. A data quality evaluation for radon/thoron was performed for precision, and no issue was noted. The summary of radon/thoron data quality will be summarized in the Final RI Report.

66. Page 4-11 4.3.1. This states that before shielding the highest radon levels were found in Lot 42, Terra Nova at 4.6 pCi/l. In fact, the radon mitigation system was installed prior to shielding, which reduced radon levels. This mixes the shielding and the radon mitigation system so that it is not clear which properties received what. Revise and clarify.

Response: The text will be revised to reflect that the radon mitigation system was installed prior to the installation of shielding. Data collected before the radon mitigation system was installed will be presented.

67. Page 4-12 What method(s) were used to make these measurements of radon and thoron?

Response: Methods for radon and thoron measurements are summarized in Section 2.6.3 of the RI Report.

68. Page 4-30. The fact that 24 of 30 samples were 'slightly' above screening criteria cannot be ignored without looking at the elevated radon and thoron readings found entering the hole in the school basement. Either item might not be an issue, but the combination begins to move towards a 'multiple lines of evidence' scenario that would be considered for other contaminants.

Response: See response to Comment 49.

69. Page 6-3 Last Paragraph. Only 1 radon mitigation system was installed.

Response: The statement will be revised to the following: "EPA installed shielding in most of the work areas and a radon mitigation system in one area of the WACC property in 2013."

70. Page 6-5,6. As discussed earlier the discussion regarding annual dose estimates needs revision.

Response: See response to Comment 57.

71. Page 7-2 Bullet 6. This discussion continues to downplay the issue of possible contamination on or around the school property. The screening levels were selected to look for contaminated materials and given the totality of the investigations, there are multiple lines of evidence that there may be material around the school and daycare center. That does not imply that these levels constitute a current health risk at these locations, but it does indicate a data gap that should be closed and the report should be revised to include this as a data gap.

Response: See response to Comment 49. Once the additional data is assessed, the Conclusions will be revised.

72. References

Equity Environmental Engineering, Letter from Robert L. Jackson to Alysha Alfieri, Project Manager Mayor's Office of Environmental Remediation RE: 308 Cooper Street Brooklyn, NY, 16EHAZ078K. April 31, 2016.

Louis Berger & Associates, PC. Radiological Scoping Survey For Former Wolff- Alport Chemical Corporation Site, 1125-1139 Irving Avenue, Queens, New York 11385. August 23, 2010.

New York State Department of Health (NYSDOH). Multi-Agency Former Wolff Alport Chemical Company Neighborhood Radiological Assessment. March 12, 2014.

EPA/RIAB. Memorandum SUBJECT: I. Results of technical review of the Memorandum "Subject: Identification of Site-related Contaminants of Concern, Remedial Action Objectives and Preliminary Remedial Action Goals to be included in the Wolff- Alport Chemical Company Site Feasibility Study" authored by CDM Smith and dated December 23, 2016. January 13, 2017.

EPA/RIAB. Memorandum (EPA/RII/CASD-RIAB SUBJECT: Technique and results of supplemental perimeter radon and thoron gas air concentration sampling measurements performed at the Former Wolff-Alport Chemical Company (FWACC) Site and in Site's vicinity within ½ mile of the perimeter of the Site in Queens and Brooklyn, NY, on 07/29 – 08/02/2013. September 24, 2013, 2013a.

EPA/RIAB. Memorandum (EPA/RII/CASD-RIAB), Subject: I. Results of measurements associated with the search for radon/thoron potential gas entry points performed in Terra Nova company, Primo company buildings located at 1127 – 1133 Irving Avenue, Public School 384 located at 242 Cooper Street, in Audrey Johnson Day Care Center located at 272 Moffat Street and in building located at 1125 Irving Avenue in Queens and Brooklyn, NY. II. Discussion of results. III. Dose assessment. August 1, 2013, 2013b.

EPA/RIAB. Memorandum (EPA/RII/CASD-RIAB). Subject: Results of thoron gas air concentration measurements performed inside and behind two buildings located at 338-350 Moffat Street, Brooklyn, NY. November 12, 2015.

Weston Solutions Inc. Subject: Trip Report. Document Control No.: 1866-2A- BBUS. Work Assignment No. 1866, Wolff-Alport Chemical Company. Contract No.: EP-S5-06-04, TDD No.: S05-0013-1206-001. Trip Report, 11/05/2012.

Weston Solutions Inc. DRAFT INTER-AGENCY RADIOLOGICAL PERIMETER SURVEY: U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION II, NEW YORK STATE DEPARTMENT OF HEALTH, AND NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE – WOLFF ALPORT SITE, REVISION 1. September 20, 2013.

Weston Solutions Inc. Radiation Assessment and Action Report Former Wolff-Alport Chemical Company Site Ridgewood, Queens County, New York. January 2016.

Response: These references will be incorporated in the Final RI as appropriate.

73. Appendix 1: PVC piping and water flow out of 335 Moffat Street occupied by ICE Glacier company (08/02/2013).

Response: The photos provided will be added as an appendix to the report.

ATSDR - Paul Charp

74. Page 4-2, Section 4.1.2.2 Use of ISOCs Data, second paragraph, first sentence – State if the concentrations were 5 pCi/g includes background or if the concentrations were 5 pCi/g above background. See 40 CFR 192.

Response: The 5 pCi/g referenced in this sentence includes background. The text will be revised to add clarification.

75. Page 4-5, Section 4.1.4.3 Background Soil Sampling (Radiological), third bullet – To not detect U-238 in a soil sample is extremely rare unless the soils are mostly sand.

Response: That is correct. CDM Smith will revise the text accordingly to clarify the statement of “no detections”. As specified in the accepted work plan and QAPP, the soil sample analysis was completed using a field gamma spectroscopy system (Canberra’s ISOCs System) to rapidly identify the predominant gamma emitting radionuclides. This approach was used because previous site studies had shown that the predominant radionuclides generated from site activities were Ra-226 and Th-232. The Minimum Detectable Concentration of U-238 when using the ISOCs is typically 1-1.5 pCi/g. Consequently, since the background levels of U-238 are less than the minimum detectable concentration, U-238 is noted as not detected.

76. Page 4-5, Section 4.1.4.4 Background Sewer Investigation, first sentence – This background number (43,000 cpm) are about 10 times higher than above ground samples and higher than the background referenced in the next paragraph. Also, the value listed does not reflect text in this section.

Response: This paragraph described background sampling performed by NYCDEP during a separate investigation conducted in 2013. The NYCDEP report is included in Appendix A, Assessment of Potential Radiological Impact Within and Adjacent to Combined Sewer System near the Former Wolff-Alport Chemical Corporation Facility. The second paragraph on page 3 of text in this section reflects the background sewer investigation conducted as part of the 2015 EPA remedial investigation. Clarifying text will be added to make it clear that the background readings were collected as part of different investigations. Later in Section 4, the vastly different background values are used to describe the two different data sets (2013 NYCDEP and the EPA RI).

77. Page 4-6, Section 4.1.4.5 Background Sediment Sampling – Coney Island Creek – Why was a sample not collected upstream from the outfall? Could the creek be impacted by ocean systems?

Response: It is unclear what outfall this is referencing. Coney Island Creek would likely be impacted by ocean systems; however, we feel it provides a good approximation of background conditions for Newtown Creek as Coney Island Creek is in a similar geographic setting and has a long history of commercial use.

78. Page 4-7, Section 4.1.5.2 Radionuclide Data, second paragraph – Units of $\mu\text{R/hr}$ are wrong. Rem is a unit of dose; R is the unit of exposure.

Response: This definition of units will be corrected to microRoentgen per hour.

79. Page 4-7, Section 4.1.5.2 Radionuclide Data, fourth paragraph – Need a better explanation of why Ra-226 and Th-232 are used in combination to determine contamination especially since they are not in the same decay chain and secular equilibrium between U-238 and Ra-226 is not applicable and may be difficult to delineate from background. Unless additional information is given, this combination usage is not too clear.

Response: While it is true that Ra-226 does not derive from the decay chain of Th-232, the parent mineral origin (the monazite sands) contains both Th-232 (a parent) and its progeny as well the U-238 parent and its progeny which includes Ra-226. Consequently, Th-232 and Ra-226 will both exist in any waste products remaining at the site or in effluents discharged outside the formal WACC property boundaries. CDM Smith will modify the wording to address this comment.

80. Page 4-11, Section 4.3.1 WACC Property, second sentence – Typical outdoor Rn-222 is about 0.5 pCi/L. Need to indicate a nominal background for thoron. Again, need to justify why you are doing a combined screening criteria especially since the two radons are in different decay chains.

Response: CDM Smith will modify the wording to remove reference to an EPA action level and substitute the site screening level that we developed. Some additional clarification on this approach is noted below:

The original proposed RI QAPP, approved by the EPA at a July 24, 2014 meeting did not include an assessment for radon and thoron outside of a review of the values established by previous EPA and NY City Department of Health Studies. The intent was to use the sampled soil data to “drive” the risk assessment and radiological dose calculations for present and future users. Because of the wide temporal variation in both thoron and radon for inside and outside conditions, a multiyear study of those two gases would be needed to establish a credible background value for the area. That study was not considered as part of the scope of work for this project.

While it is true the EPA screening criteria are based on radon, it should be noted that the radiological dose and subsequent risk from exposure to thoron is less than that of radon (by a factor of ~ 2) for equivalent air concentrations. Consequently, placing the two inert gases together and using the 4 pCi/L as the screening criteria for the combined radon and thoron concentrations, is a conservative approach.

81. Page 4-12, Section 4.3.2 338-348 and 350 Moffat, third sentence – The EPA Action Level is for Rn-222, not Rn-220 (thoron).

Response: See response to Comment 80 above.

82. Page 4-15, Section 4.4.2 – It might be better to separate the Ra-226 from the Th-232 values.

Response: Discussion of the radiological contamination will present separate concentrations for Ra-226 and Th-232.

83. Page 4-15, Section 4.4.2.1, first sentence – With concentrations of what up to 1,100 pCi/g?

Response: The statement will be revised to the following: “... with concentrations of Th-232 up to 1,100 pCi/g.”

84. Page 4-15, Section 4.4.2.1, first sentence and Page 4-20, Section 4.4.3 Conclusions of the Soil Investigations, second bullet – See Section 4.4.2.1. The maximum concentrations listed do not match.

Response – The 1,100 pCi/g concentration was observed during a different investigation conducted in 2010. The bullet will be revised to include this information and will also provide the maximum concentration observed during the RI.

85. Page 4-22, Sewer Pipeline Gamma Measurements, Main Sewer Line, first sentence – The creek should be more extensively sampled.

Response: For the purposes of this RI, CDM Smith and EPA believe that the extent of sampling in Newtown Creek is sufficient. Studies show that there are some radiological impacts in the creek at the outfall; however, these impacts appear to be limited and are well below the ecological screening criteria (Final Ecological Screening Evaluation Technical Memorandum, CDM Smith 2016).

86. Page 4-25, first paragraph on page, last sentence – Is the 1.34 pCi/g background? This is less than two times background in this section.

Response: The 1.34 pCi/g result is not representative of background. This result was from a sample collected within a sewer manhole on Irving Avenue, located over 1000 feet downgradient from the Irving Ave/Cooper St intersection. This result was not identified as background for sewer materials. The background for soils developed was utilized for all solids sampled at the site.

87. Page 4-25, 2015/2016 RI, second bullet – How is this explained? (The concrete sample in this location was three orders of magnitude less than the cast iron).

Response: The disparity is more likely the result of contaminated sludge that has built up on the cast iron pipe as compared to the concrete in the vault. Additional discussion will be added to clarify this difference.

88. Page 4-26, Section 4.5.5 Sewer Discharge Sediment Sampling, second paragraph, first sentence – Were they sediment samples? At what depth were the samples collected?

Response: Yes, they were sediment samples. The first sentence in Section 4.5.5 will be revised to state: “Eight vibracore sediment sampling locations were advanced to varying depths with a maximum of 10 feet bgs near the outfall where the sewer line for WACC discharges.” Exact depths of the samples are presented in Table 4-13.

89. Page 4-26, Section 4.5.5 Sewer Discharge Sediment Sampling, second paragraph, second sentence – Need clarification on “surficial sediment samples.”

Response: Surficial sediment samples are those collected from the surface of the sediment layer. For example, a sample collected from 0 to 0.5 feet bgs in the sediment is a surficial sediment sample. This clarification will be added to the RI Report.

90. Page 4-27, second paragraph on page and fifth bullet – If no other facility used Th-232, then why is it impossible to determine if WACC was the culprit?

Response: It is undetermined if Th-232 could have entered Newtown Creek from any other facility at any time in the past. This large outfall receives stormwater overflow from much of Brooklyn and Queens. It is an area of sediment accumulation and would concentrate Th-232 from any source, including historical sources.

91. Page 5-1, Section 5.1 Selection of Principal Contaminants, second paragraph – In the parenthesis, thorium and radium should be switched out for Th-232 and Ra-226.

Response: The sentence will be revised to include the radioisotopes and remove the radioactive metal.

92. Page 5-1, Section 5.2 Physical and Chemical Properties Influencing Contaminant Fate and Transport, first sentence – Don’t you mean Ra-226 although U-238 is the parent?

Response: Correct. The sentence will be revised to state the following: “... the significant amounts of Th-232 and U-238, which resulted in Ra-226, were introduced to the soils from the monazite sands and byproducts...”

93. Page 5-6, Section 5.4 Contaminant Migration, second sentence – If sulfuric acid was used in the processing of the monazite sands, then radium, which would be radium sulfate, would be insoluble and not mobile.

Response: CDM Smith will revise the fate and transport text accordingly.

94. Page 5-12, second paragraph – Sidewalks should be considered contaminated materials as well even though they are above the contaminated soils.

Response: Sidewalks will be added to the list of potential sources of radiation listed in this section.

95. Page 6-2, exposure routes – Suggest adding which receptor for each route, e.g., construction and utility workers for second, third, and fourth bullets, and all receptors for fifth bullet.

Response: See response to Comment 12. These types of details will be added to the exposure routes presented in the Final RI Report.

96. Page 6-2, last paragraph (Quantification) – This paragraph should indicate that radiation exposure quantification is somewhat different from chemical quantification.

Response: See response to Comment 12. This clarifying text will be added to the summary of the Final HHRA included in Section 6 of the RI Report.

97. Page 6-5, Future Receptors Radionuclide Risk, first paragraph, third sentence – More related to Th-232 decay products than Th-232. Clarify Statement.

Response: See response to Comment 12. This clarifying text will be added to the summary of the Final HHRA included in Section 6 of the RI Report.

98. Page 6-5, Future Receptors Radionuclide Risk, third paragraph, second sentence – Inhalation and ingestion must be considered.

Response: See response to Comment 12.

99. Page 6-6, first paragraph and second paragraph – Indicate that this is above nominal background exposures.

Response: See response to Comment 12. This clarifying text will be added to the summary of the Final HHRA included in Section 6 of the RI Report.

100. Page 6-6, third paragraph – K-40 is biologically regulated so most environmental assessments ignore its contribution to risk.

Response: See response to Comment 12. In chemical (non-radiological) risk assessments, all contaminants that exceed screening levels are carried through the risk assessment. Background is then used as a tool for risk managers. K-40 has not been treated differently than any other non-site-related contaminant at a Superfund site. The contribution to total risk for Chemicals of Potential Concerns (COPCs) and Radionuclides of Potential Concerns (ROPs) that are at background levels are discussed in the HHRA. Th-232 (responsible for ~90% of external gamma radiation) and Ra-226 (responsible for most of the internal radon exposure) are the primary risk drivers and will drive the remedy selection for radiological contamination at the site.

NYSDOH - Jerry Collin

101. Pg vi. Figure 4-8 appears to be Newtown Creek vs. Newtown Creek –

Response: The Table of Contents will be revised to include the hyphen between Newtown Creek and East Branch.

102. CDM Smith report pg. 6-1, 6-2: to be consistent with NYSDOH rad. contaminated sites policy a previous comment was submitted to include resident farmer scenario as an exposure pathway; a response was received to acknowledge support of the comment.

Response: See response to Comment 12. This will be addressed in the Final HHRA and summarized in Section 6 of the RI Report. The HHRA will include consumption of homegrown produce for future residents (urban gardeners).

103. Reference is cited several times to an EPA site action level of 4 pCi/L for radon and thoron based on another EPA region 2 site action level for homes.

Response: CDM Smith will revise the text to reflect the use of the screening values presented in Table 4-3 and not the action level of 4 pCi/L.

104. Unless done for diagnostic purposes, it is not clear why outdoor areas, a storage shed and basement, crawlspace areas that appear to be unsuitable for occupancy were tested.

Response: This work was conducted by EPA RST (2015). It is CDM Smith's understanding that these areas were tested with the intent of looking for potential contaminated soils.

105. Why are there a separate screening levels for radon and thoron if the action level is 4 pCi/L?

Response: CDM Smith will revise the text to reflect the use of the screening values presented in Table 4-3 and not the action level of 4 pCi/L.

106. Page 8-2, although the US EPA "Citizen's Guide...." Is a cited reference other US EPA guidance, or consensus guidance which US EPA defers to, may have been appropriate to reference and to follow for radon testing. Although 'diagnostic' tests may be useful radon tests (and thoron tests, by extension) would be done so they are representative of frequently occupied indoor area breathing zones.

Response: Reference to EPA's Radon Measurement in Schools Guidance document, dated July 1993 will be added to this section. In accordance with the EPA guidance document all occupied rooms were tested.

107. As it is referred to as being used to assess radon/thoron, it appears the DurrIDGE Rad-7 monitor operation should be/should have been NYS Environmental Laboratory Approval Program certified.

Response: CDM Smith cannot verify if the DurrIDGE Rad-7 monitor was certified by NYS Environmental Laboratory because the radon/thoron survey was performed by LBA, and the report (LBA 2010) does not have any documentation on the instrument certification.

108. Att F, pg. 2936/4784, Photo Documentation Log; photos 6, 7, 8, 10 and 10 – placement of radon test canisters does not appear to be in accordance with US EPA guidance (typical placement is 1 foot from interior walls, 3 feet from exterior walls)

Response: This is from a historical report (Weston 2014) that discussed an investigation that took place from 2012 to 2014. CDM Smith did not perform these investigations.

109. Photo 11 – is this frequently occupied space or a test for diagnostic purpose?

Response: See response to Comment 108.

110. Photo 14- is the system labeled as a radon mitigation system? Who will perform any recommended maintenance on the system?

Response: See response to Comment 108.

111. Was post mitigation thoron testing done where radon mitigation system installed at Terra Nova?

Response: Only radon testing was completed during the 2014 Weston investigation.

112. Was this the only location for a radon mitigation system?

Response: A radon mitigation system was only installed in the office of Terra Nova.

113. Pg 6-3 of CDM report seems to suggest more than one mitigation system was installed

Response: Only one radon mitigation system was installed. The text will be revised as such.

114. Table 4-3 and Subsection 4.3.1 may have a slight inconsistency with the thoron/radon screening criteria— is 4.3.1 a sum? Is basement radon criteria intended?

Response: The text will be revised to match the screening criteria presented on Table 4-3.

City of New York - Haley Stein

115. In the executive summary, the section describing the nature and extent of contamination of building materials on page ES-5 identifies a maximum concentration of 415.2 pCi/gram without identifying the isotope for which the concentration result represents. The isotope should be identified.

Response: The text will be revised to identify the isotope, Th-232, on page ES-5 and 4-11.

116. In section 1.2.1., The City recommends that the RI include a more detailed description of prior owners and uses of the parcels comprising and adjacent to the Site to help determine if any of these prior uses contributed to the Site's non-radiological contamination. This information should include materials used and historical manufacturing processes located at these sites and the potential impact from these uses.

Response: CDM Smith will provide additional information on the prior owners and uses of the parcels comprising and adjacent to the Site to further facilitate evaluation of potential offsite contribution to the sites' non-radiological contamination.

117. In section 2.4.5., The City requests that the title of Section 2.4.5 be changed from "Sewer Discharge Sediment Sampling" to the more accurate "Newtown Creek Sediment Sampling" since this section discusses sediment samples that include a mixture of known and unknown solid sources that are not limited to CSO discharges.

Response: The title of Section 2.4.5 will be revised as recommended.

118. In section 6.1.2, The Exposure Assessment should indicate whether recommended EPA calculators were used to establish the preliminary remediation goals and soil screening levels used to determine risk estimates for site receptors.

Response: See Response to Comment 12. This section of the RI Report summarizes the results of the Draft Human Health Risk Assessment. The RI report will be revised based on a finalized Human Health Risk Assessment. The HHRA uses RESRAD as the primary model to estimate exposure and risk. In addition, the EPA RPG calculator is used to estimate cancer risk for significant exposure scenarios for comparison purposes.

119. In section 6.1.5, The inclusion of Potassium-40 as a risk contributor to on-site receptors is contrary to EPA guidance. Potassium-40 is a naturally occurring radionuclide and there is no indication that its presence at the Site is related to Site activity and, moreover, its on-site sample results are within the range of background concentrations. EPA guidance provides that constituents of potential concern that are not site-related and are within background levels are generally not relevant to risk determinations. See OSWER 9285.6-20 "Radiation Risk Assessment at Superfund Sites: Q&A. section VI, Background Radiation, Q40"; OSWER 9285.6-07P "Role of Background in the CERCLA Cleanup Program." Further, while risk estimates associated with background concentrations of site radionuclides of concern should be identified, they should not be relied upon in determining site exposure estimates (with the exception of Rn). Therefore, Potassium-40 should not be included as a risk contributor because there is no indication that its presence is site-related or that it exceeds background concentrations.

Response: See Responses to Comment 12 and Comment 100. This section of the RI Report summarizes the results of the Draft HHRA. The RI report will be revised based on a finalized HHRA.